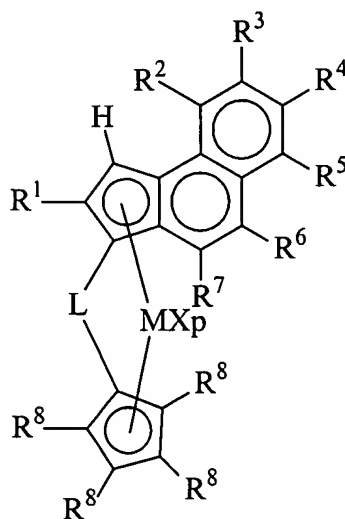


Claims 1 – 16: (Cancelled)

17. (New) A metallocene compound of formula (I):



(I)

wherein:

- M is a transition metal selected from group 3, 4, 5, 6 or a lanthanide or an actinide group in the Periodic Table of Elements;
- p is an integer from 0 to 3, wherein p is equal to a formal oxidation state of M minus 2;
- X, is the same or different, and is hydrogen, a halogen, R, OR, OSO<sub>2</sub>CF<sub>3</sub>, OCOR, SR, NR<sub>2</sub> or PR<sub>2</sub>, wherein R is a C<sub>1</sub>-C<sub>40</sub> hydrocarbon group optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements; or two X can optionally form a substituted or unsubstituted butadienyl radical, or a OR'O group, wherein R' is a divalent radical selected from a C<sub>1</sub>-C<sub>40</sub> alkylidene radical, a C<sub>6</sub>-C<sub>40</sub> arylidene radical, a C<sub>7</sub>-C<sub>40</sub> alkylarylidene radical and a C<sub>7</sub>-C<sub>40</sub> arylalkylidene radical;
- L is a divalent bridging group selected from a C<sub>1</sub>-C<sub>20</sub> alkylidene radical, a C<sub>3</sub>-C<sub>20</sub> cycloalkylidene radical, a C<sub>6</sub>-C<sub>20</sub> arylidene radical, a C<sub>7</sub>-C<sub>20</sub> alkylarylidene radical, or a C<sub>7</sub>-C<sub>20</sub> arylalkylidene radical optionally comprising at least one heteroatom

belonging to groups 13-17 of the Periodic Table of Elements, or a silylidene radical comprising up to 5 silicon atoms;

- $R^1$  is a  $C_1$ - $C_{40}$  hydrocarbon group optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;

- $R^3$  is a  $C_1$ - $C_{40}$  hydrocarbon group optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;

- $R^2$ ,  $R^4$  and  $R^5$ , are the same or different from each other, and are hydrogen or  $C_1$ - $C_{40}$  hydrocarbon groups optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements, with the proviso that at least one among  $R^2$ ,  $R^4$  and  $R^5$  is hydrogen;

- $R^6$  and  $R^7$ , are the same or different from each other, and are hydrogen or  $C_1$ - $C_{40}$  hydrocarbon groups optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;

$R^8$ , are the same or different from each other, and are hydrogen or  $C_1$ - $C_{50}$  hydrocarbon groups optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements, or two or more  $R^8$  optionally can join together to form at least one 3-7 membered ring, the 3-7 membered ring comprising at least one heteroatom belonging to groups 13-16 of the Periodic Table of Elements; and the 3-7 membered ring optionally can be substituted with at least one  $C_1$ - $C_{20}$  hydrocarbon group optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements; and

- $R^3$  with  $R^4$  and/or  $R^4$  with  $R^5$  can optionally join to form a aliphatic or aromatic 3-7 membered ring optionally comprising at least one heteroatom belonging to groups 13-16 of the Periodic Table of Elements, the aliphatic or aromatic 3-7 membered ring optionally can comprise one or more hydrocarbon substituents comprising from 1 to 20 carbon atoms.

18. (New) The metallocene compound of claim 17, wherein:

- M is titanium, zirconium or hafnium;

- p is 2;

- R is a linear or branched, cyclic or acyclic C<sub>1</sub>-C<sub>40</sub>-alkyl radical, C<sub>2</sub>-C<sub>40</sub> alkenyl radical, C<sub>2</sub>-C<sub>40</sub> alkynyl radical, C<sub>6</sub>-C<sub>40</sub>-aryl radical, C<sub>7</sub>-C<sub>40</sub>-alkylaryl radical or C<sub>7</sub>-C<sub>40</sub>-arylalkyl radical, optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;

- X is hydrogen, a halogen, or R;

- L is Z(R'')<sub>2</sub>, wherein Z is a carbon or a silicon atom, and R'' is a linear or branched, cyclic or acyclic C<sub>1</sub>-C<sub>10</sub>-alkyl radical, C<sub>2</sub>-C<sub>10</sub> alkenyl radical, C<sub>2</sub>-C<sub>10</sub> alkynyl radical, C<sub>6</sub>-C<sub>10</sub>-aryl radical, C<sub>7</sub>-C<sub>10</sub>-alkylaryl radical, or C<sub>7</sub>-C<sub>10</sub>-arylalkyl radical optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements.

19. (New) The metallocene compound of claim 17, wherein:

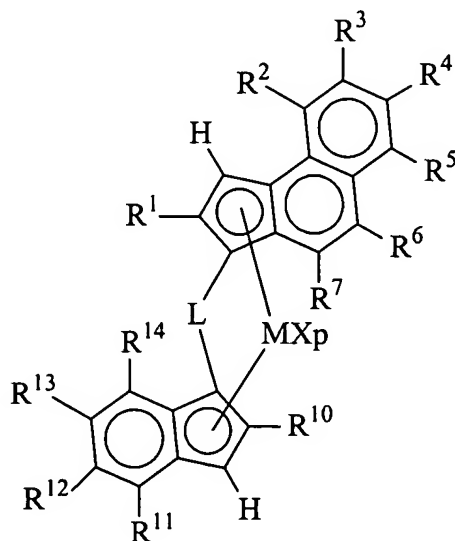
- R<sup>1</sup> is a linear or branched, saturated or unsaturated C<sub>1</sub>-C<sub>20</sub>-alkyl radical;

- R<sup>3</sup> is a linear or branched, saturated or unsaturated C<sub>1</sub>-C<sub>20</sub>-alkyl radical or a C<sub>6</sub>-C<sub>40</sub>-aryl, radical;

- R<sup>2</sup>, R<sup>4</sup> and R<sup>5</sup> are hydrogen; and

- R<sup>6</sup> and R<sup>7</sup> are hydrogen or a linear or branched, saturated or unsaturated C<sub>1</sub>-C<sub>20</sub>-alkyl radical.

20. (New) A metallocene compound comprising formula (II):



(II)

wherein:

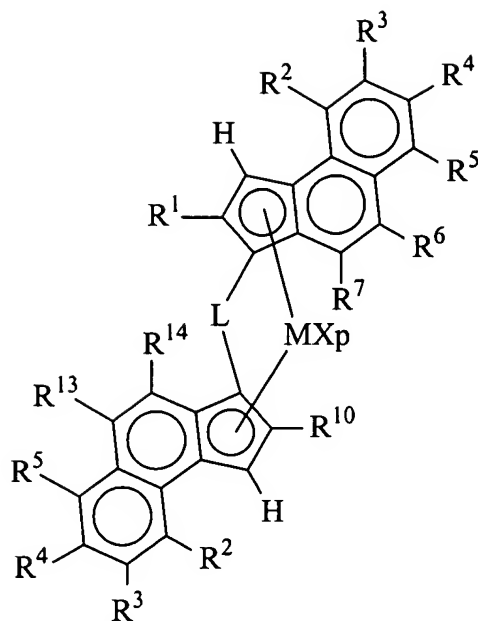
- M is a transition metal selected from group 3, 4, 5, 6 or a lanthanide or an actinide group in the Periodic Table of Elements;
- p is an integer from 0 to 3, wherein p is equal to a formal oxidation state of M minus 2;
- X, is the same or different, and is hydrogen, a halogen, R, OR, OSO<sub>2</sub>CF<sub>3</sub>, OCOR, SR, NR<sub>2</sub> or PR<sub>2</sub>, wherein R is a C<sub>1</sub>-C<sub>40</sub> hydrocarbon group optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements, or two X can optionally form a substituted or unsubstituted butadienyl radical, or a OR'O group, wherein R' is a divalent radical selected from a C<sub>1</sub>-C<sub>40</sub> alkylidene radical, a C<sub>6</sub>-C<sub>40</sub> arylidene radical, a C<sub>7</sub>-C<sub>40</sub> alkylarylidene radical and a C<sub>7</sub>-C<sub>40</sub> arylalkylidene radical;
- L is a divalent bridging group selected from a C<sub>1</sub>-C<sub>20</sub> alkylidene radical, a C<sub>3</sub>-C<sub>20</sub> cycloalkylidene radical, a C<sub>6</sub>-C<sub>20</sub> arylidene radical, a C<sub>7</sub>-C<sub>20</sub> alkylarylidene radical, or a C<sub>7</sub>-C<sub>20</sub> arylalkylidene radical optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements, or a silylidene radical comprising up to 5 silicon atoms;
- R<sup>1</sup> is a C<sub>1</sub>-C<sub>40</sub> hydrocarbon group optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;
- R<sup>3</sup> is a C<sub>1</sub>-C<sub>40</sub> hydrocarbon group optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;
- R<sup>2</sup>, R<sup>4</sup> and R<sup>5</sup>, are the same or different from each other, and are hydrogen or C<sub>1</sub>-C<sub>40</sub> hydrocarbon groups optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements, with the proviso that at least one among R<sup>2</sup>, R<sup>4</sup> and R<sup>5</sup> is hydrogen;
- R<sup>6</sup> and R<sup>7</sup>, are the same or different from each other, and are hydrogen or C<sub>1</sub>-C<sub>40</sub> hydrocarbon groups optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;
- R<sup>10</sup> is hydrogen or a C<sub>1</sub>-C<sub>40</sub> hydrocarbon group optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;

- $R^{11}$ ,  $R^{12}$ ,  $R^{13}$  and  $R^{14}$ , are the same or different from each other, and are hydrogen or  $C_1$ - $C_{40}$  hydrocarbon groups optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements, or two adjacent  $R^{11}$ ,  $R^{12}$ ,  $R^{13}$  and  $R^{14}$  can optionally join to form a 3-7 membered ring optionally comprising at least one heteroatom belonging to groups 13-16 of the Periodic Table of Elements, the 3-7 membered ring optionally can comprise one or more hydrocarbon substituents comprising from 1 to 20 carbon atoms; and
- $R^3$  with  $R^4$  and/or  $R^4$  with  $R^5$  can optionally join to form a aliphatic or aromatic 3-7 membered ring optionally comprising at least one heteroatom belonging to groups 13-16 of the Periodic Table of Elements, the aliphatic or aromatic 3-7 membered ring optionally can comprise one or more hydrocarbon substituents comprising from 1 to 20 carbon atoms.

21. (New) The metallocene compound according to claim 20, wherein:

- $R^{10}$  is a linear or branched  $C_1$ - $C_{20}$ -alkyl radical;
- $R^{11}$  is a  $C_6$ - $C_{40}$ -aryl radical, a  $C_7$ - $C_{40}$ -alkylaryl radical or a  $C_7$ - $C_{40}$ -arylalkyl radical, or with  $R^{12}$  forms a 3-7 membered ring optionally substituted with at least one hydrocarbon group comprising from 1 to 20 carbon atoms;
- $R^{12}$  is hydrogen or with  $R^{11}$  forms a 3-7 membered ring optionally substituted with at least one hydrocarbon group comprising from 1 to 20 carbon atoms; and
- $R^{14}$  and  $R^{13}$  are hydrogen or  $C_1$ - $C_{20}$  alkyl radicals.

22. (New) A metallocene compound comprising formula (III):



(III)

wherein:

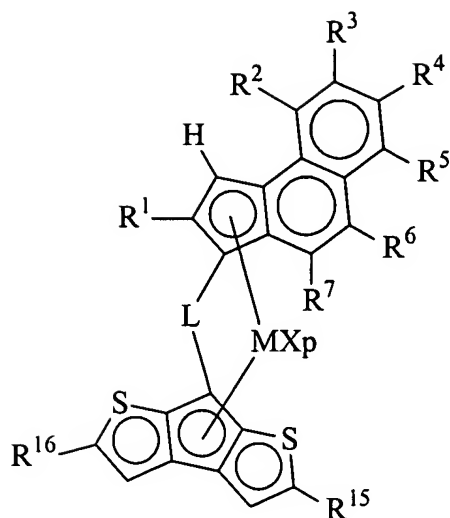
- M is a transition metal selected from group 3, 4, 5, 6 or a lanthanide or an actinide group in the Periodic Table of Elements;
- p is an integer from 0 to 3, wherein p is equal to a formal oxidation state of M minus 2;
- X, is the same or different, and is hydrogen, a halogen, R, OR, OSO<sub>2</sub>CF<sub>3</sub>, OCOR, SR, NR<sub>2</sub> or PR<sub>2</sub>, wherein R is a C<sub>1</sub>-C<sub>40</sub> hydrocarbon group optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements; or two X can optionally form a substituted or unsubstituted butadienyl radical, or a OR'O group, wherein R' is a divalent radical selected from a C<sub>1</sub>-C<sub>40</sub> alkylidene radical, a C<sub>6</sub>-C<sub>40</sub> arylidene radical, a C<sub>7</sub>-C<sub>40</sub> alkylarylidene radical and a C<sub>7</sub>-C<sub>40</sub> arylalkylidene radical;
- L is a divalent bridging group selected from a C<sub>1</sub>-C<sub>20</sub> alkylidene radical, a C<sub>3</sub>-C<sub>20</sub> cycloalkylidene radical, a C<sub>6</sub>-C<sub>20</sub> arylidene radical, a C<sub>7</sub>-C<sub>20</sub> alkylarylidene radical, or a C<sub>7</sub>-C<sub>20</sub> arylalkylidene radical optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements, or a silylidene radical comprising up to 5 silicon atoms;
- R<sup>1</sup> is a C<sub>1</sub>-C<sub>40</sub> hydrocarbon group optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;

- $R^3$  is a  $C_1$ - $C_{40}$  hydrocarbon group optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;
- $R^2$ ,  $R^4$  and  $R^5$ , are the same or different from each other, and are hydrogen or  $C_1$ - $C_{40}$  hydrocarbon groups optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements, with the proviso that at least one among  $R^2$ ,  $R^4$  and  $R^5$  is hydrogen;
- $R^6$  and  $R^7$ , are the same or different from each other, and are hydrogen or  $C_1$ - $C_{40}$  hydrocarbon groups optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;
- $R^{10}$  is hydrogen or a  $C_1$ - $C_{40}$  hydrocarbon group optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;
- $R^{13}$  and  $R^{14}$ , are the same or different from each other, and are hydrogen or  $C_1$ - $C_{40}$  hydrocarbon groups optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements, or  $R^{13}$  and  $R^{14}$  can optionally join to form a 3-7 membered ring optionally comprising at least one heteroatom belonging to groups 13-16 of the Periodic Table of Elements, the 3-7 membered ring optionally can comprise one or more hydrocarbon substituents comprising from 1 to 20 carbon atoms; and
- $R^3$  with  $R^4$  and/or  $R^4$  with  $R^5$  can optionally join to form a aliphatic or aromatic 3-7 membered ring optionally comprising at least one heteroatom belonging to groups 13-16 of the Periodic Table of Elements, the aliphatic or aromatic 3-7 membered ring optionally can comprise one or more hydrocarbon substituents comprising from 1 to 20 carbon atoms.

23. (New) The metallocene compound according to claim 22, wherein:

- $R^{10}$  is a linear or branched  $C_1$ - $C_{20}$ -alkyl radical; and
- $R^{14}$  and  $R^{13}$  are hydrogen or  $C_1$ - $C_{20}$  alkyl radicals.

24. (New) A metallocene compound comprising formula (IV):



(IV)

wherein:

- M is a transition metal selected from group 3, 4, 5, 6 or a lanthanide or an actinide group in the Periodic Table of Elements;
- p is an integer from 0 to 3, wherein p is equal to a formal oxidation state of M minus 2;
- X, is the same or different, and is hydrogen, a halogen, R, OR, OSO<sub>2</sub>CF<sub>3</sub>, OCOR, SR, NR<sub>2</sub> or PR<sub>2</sub>, wherein R is a C<sub>1</sub>-C<sub>40</sub> hydrocarbon group optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements; or two X can optionally form a substituted or unsubstituted butadienyl radical, or a OR'O group, wherein R' is a divalent radical selected from a C<sub>1</sub>-C<sub>40</sub> alkylidene radical, a C<sub>6</sub>-C<sub>40</sub> arylidene radical, a C<sub>7</sub>-C<sub>40</sub> alkylarylidene radical and a C<sub>7</sub>-C<sub>40</sub> arylalkylidene radical;
- L is a divalent bridging group selected from a C<sub>1</sub>-C<sub>20</sub> alkylidene radical, a C<sub>3</sub>-C<sub>20</sub> cycloalkylidene radical, a C<sub>6</sub>-C<sub>20</sub> arylidene radical, a C<sub>7</sub>-C<sub>20</sub> alkylarylidene radical, or a C<sub>7</sub>-C<sub>20</sub> arylalkylidene radical optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements, or a silylidene radical comprising up to 5 silicon atoms;
- R<sup>1</sup> is a C<sub>1</sub>-C<sub>40</sub> hydrocarbon group optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;



- R<sup>3</sup> is a C<sub>1</sub>-C<sub>40</sub> hydrocarbon group optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;
- R<sup>2</sup>, R<sup>4</sup> and R<sup>5</sup>, are the same or different from each other, and are hydrogen or C<sub>1</sub>-C<sub>40</sub> hydrocarbon groups optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements, with the proviso that at least one among R<sup>2</sup>, R<sup>4</sup> and R<sup>5</sup> is hydrogen;
- R<sup>6</sup> and R<sup>7</sup>, are the same or different from each other, and are hydrogen or C<sub>1</sub>-C<sub>40</sub> hydrocarbon groups optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;
- R<sup>15</sup> and R<sup>16</sup>, are the same or different from each other, and are hydrogen or C<sub>1</sub>-C<sub>40</sub> hydrocarbon groups optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements; and
- R<sup>3</sup> with R<sup>4</sup> and/or R<sup>4</sup> with R<sup>5</sup> can optionally join to form a aliphatic or aromatic 3-7 membered ring optionally comprising at least one heteroatom belonging to groups 13-16 of the Periodic Table of Elements, the aliphatic or aromatic 3-7 membered ring optionally can comprise one or more hydrocarbon substituents comprising from 1 to 20 carbon atoms.

25. (New) The metallocene compound of claim 24, wherein:

- M is titanium, zirconium or hafnium;
- p is 2;
- R is a linear or branched, cyclic or acyclic C<sub>1</sub>-C<sub>40</sub>-alkyl radical, C<sub>2</sub>-C<sub>40</sub> alkenyl radical, C<sub>2</sub>-C<sub>40</sub> alkynyl radical, C<sub>6</sub>-C<sub>40</sub>-aryl radical, C<sub>7</sub>-C<sub>40</sub>-alkylaryl radical or C<sub>7</sub>-C<sub>40</sub>-arylalkyl radical, optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;
- X is hydrogen, a halogen, or R;
- L is Z(R'')<sub>2</sub>, wherein Z is a carbon or a silicon atom, and R'' is a linear or branched, cyclic or acyclic C<sub>1</sub>-C<sub>10</sub>-alkyl radical, C<sub>2</sub>-C<sub>10</sub> alkenyl radical, C<sub>2</sub>-C<sub>10</sub> alkynyl radical, C<sub>6</sub>-C<sub>10</sub>-aryl radical, C<sub>7</sub>-C<sub>10</sub>-alkylaryl radical, or C<sub>7</sub>-C<sub>10</sub>-arylalkyl radical optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements.

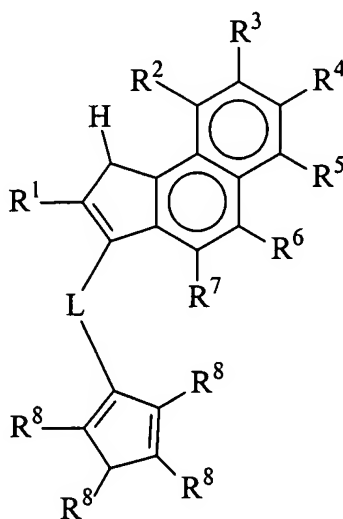
26. (New) The metallocene compound of claim 24, wherein:

- $R^1$  is a linear or branched, saturated or unsaturated  $C_1$ - $C_{20}$ -alkyl radical;
- $R^3$  is a linear or branched, saturated or unsaturated  $C_1$ - $C_{20}$ -alkyl radical or a  $C_6$ - $C_{40}$ -aryl, radical;
- $R^2$ ,  $R^4$  and  $R^5$  are hydrogen; and
- $R^6$  and  $R^7$  are hydrogen or a linear or branched, saturated or unsaturated  $C_1$ - $C_{20}$ -alkyl radical.

27. (New) The metallocene compound according to claim 24, wherein  $R^{15}$  and  $R^{16}$  are linear or branched  $C_1$ - $C_{40}$ -alkyl radicals optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements.

28. (New) A process for preparing a metallocene compound of formula (I) comprising:

- contacting a compound of formula (Ia)



(Ia)

and/or its double bond isomers with a base selected from  $T_jB$ ,  $TMgT^1$ , sodium hydride, potassium hydride, metallic sodium, metallic potassium, and combinations thereof, wherein:

- $L$  is a divalent bridging group selected from a  $C_1$ - $C_{20}$  alkylidene radical, a  $C_3$ - $C_{20}$  cycloalkylidene radical, a  $C_6$ - $C_{20}$  arylidene radical, a  $C_7$ - $C_{20}$

alkylarylidene radical, or a C<sub>7</sub>-C<sub>20</sub> arylalkylidene radical optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements, or a silylidene radical comprising up to 5 silicon atoms;

- R<sup>1</sup> is a C<sub>1</sub>-C<sub>40</sub> hydrocarbon group optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;

- R<sup>3</sup> is a C<sub>1</sub>-C<sub>40</sub> hydrocarbon group optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;

- R<sup>2</sup>, R<sup>4</sup> and R<sup>5</sup>, are the same or different from each other, and are hydrogen or C<sub>1</sub>-C<sub>40</sub> hydrocarbon groups optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements, with the proviso that at least one among R<sup>2</sup>, R<sup>4</sup> and R<sup>5</sup> is hydrogen;

- R<sup>6</sup> and R<sup>7</sup>, are the same or different from each other, and are hydrogen or C<sub>1</sub>-C<sub>40</sub> hydrocarbon groups optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;

- R<sup>8</sup>, are the same or different from each other, and are hydrogen or C<sub>1</sub>-C<sub>50</sub> hydrocarbon groups optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements, or two or more R<sup>8</sup> optionally can join together to form at least one 3-7 membered ring, the 3-7 membered ring comprising at least one heteroatom belonging to groups 13-16 of the Periodic Table of Elements; and the 3-7 membered ring optionally can be substituted with at least one C<sub>1</sub>-C<sub>20</sub> hydrocarbon group optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements; and

- R<sup>3</sup> with R<sup>4</sup> and/or R<sup>4</sup> with R<sup>5</sup> can optionally join to form a aliphatic or aromatic 3-7 membered ring optionally comprising at least one heteroatom belonging to groups 13-16 of the Periodic Table of Elements, the aliphatic or aromatic 3-7 membered ring optionally can comprise one or more hydrocarbon substituents comprising from 1 to 20 carbon atoms;

- B is an alkaline or alkali-earth metal;

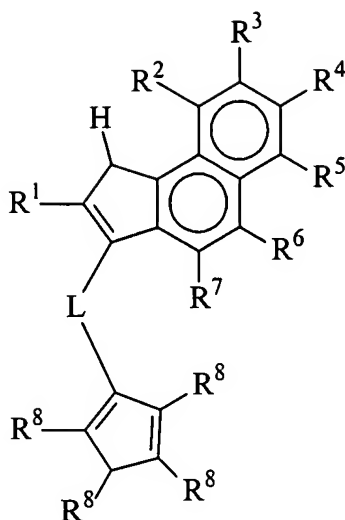
- j is 1 or 2, wherein j is equal to 1 when B is an alkaline metal, and j is equal to 2 when B is an alkali-earth metal;

- T is a linear or branched, cyclic or acyclic C<sub>1</sub>-C<sub>20</sub>-alkyl radical, C<sub>6</sub>-C<sub>20</sub>-aryl radical, C<sub>7</sub>-C<sub>20</sub>-alkylaryl radical, or C<sub>7</sub>-C<sub>20</sub>-arylalkyl radical, optionally comprising one or more Si or Ge atoms;
- T<sup>1</sup> is a halogen or OR<sup>'''</sup>, wherein R<sup>'''</sup> is a linear or branched, cyclic or acyclic C<sub>1</sub>-C<sub>40</sub>-alkyl radical, C<sub>6</sub>-C<sub>40</sub>-aryl radical, C<sub>7</sub>-C<sub>40</sub>-alkylaryl radical or C<sub>7</sub>-C<sub>40</sub>-arylalkyl radical, optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements to form a metallocene compound product, wherein a molar ratio between the base and a ligand of the formula (Ia) is at least 2:1; and
- contacting the metallocene compound product with a compound of formula MX<sub>p+2</sub>, wherein:
  - M is a transition metal selected from group 3, 4, 5, 6 or a lanthanide or an actinide group in the Periodic Table of Elements;
  - p is an integer from 0 to 3, wherein p is equal to a formal oxidation state of M minus 2; and
  - X, is the same or different, and is hydrogen, a halogen, R, OR, OSO<sub>2</sub>CF<sub>3</sub>, OCOR, SR, NR<sub>2</sub> or PR<sub>2</sub>, wherein R is a C<sub>1</sub>-C<sub>40</sub> hydrocarbon group optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements; or two X can optionally form a substituted or unsubstituted butadienyl radical, or a OR'O group, wherein R' is a divalent radical selected from a C<sub>1</sub>-C<sub>40</sub> alkylidene radical, a C<sub>6</sub>-C<sub>40</sub> arylidene radical, a C<sub>7</sub>-C<sub>40</sub> alkylarylidene radical and a C<sub>7</sub>-C<sub>40</sub> arylalkylidene radical.

29. (New) The process for preparing the metallocene compound of claim 28, wherein B is lithium.

30. (New) The process for preparing the metallocene compound of claim 28, wherein T is a methyl radical or butyl radical.

31. (New) A ligand of formula (Ia):



(Ia)

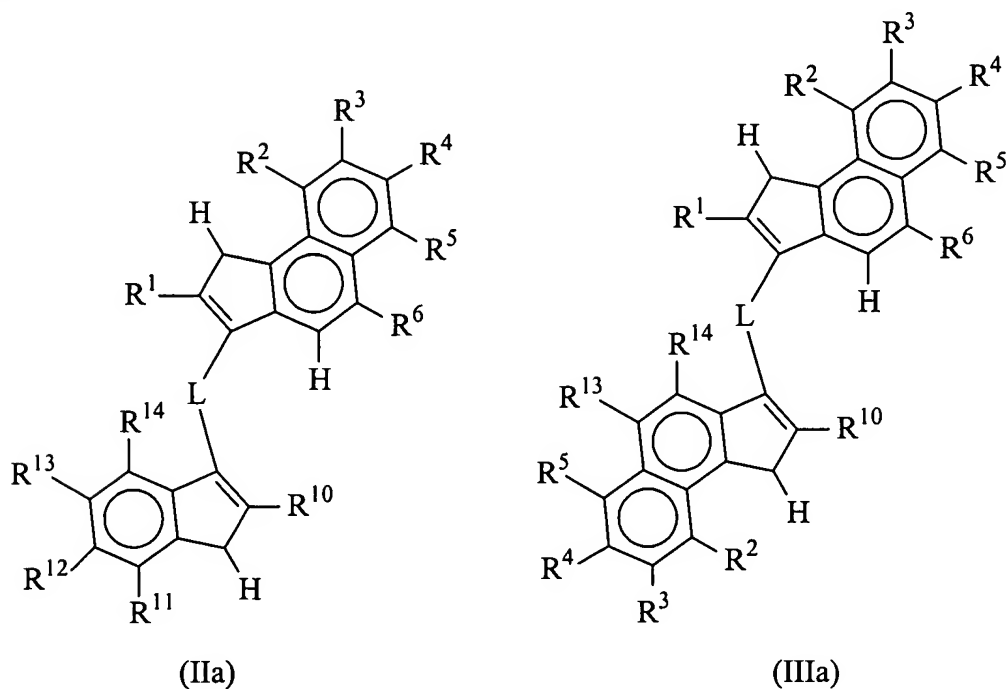
and/or its double bond isomers, wherein:

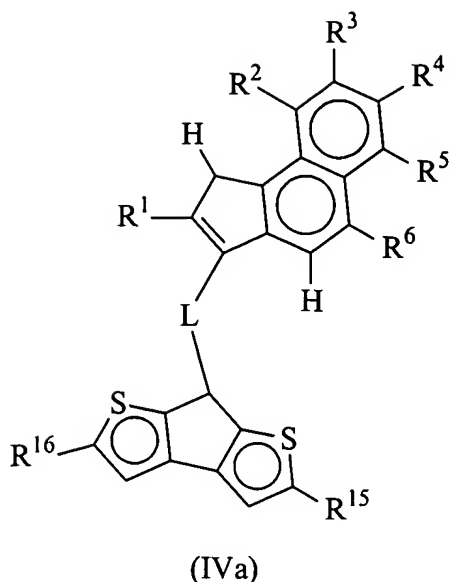
- L is a divalent bridging group selected from a C<sub>1</sub>-C<sub>20</sub> alkylidene radical, a C<sub>3</sub>-C<sub>20</sub> cycloalkylidene radical, a C<sub>6</sub>-C<sub>20</sub> arylidene radical, a C<sub>7</sub>-C<sub>20</sub> alkylarylidene radical, or a C<sub>7</sub>-C<sub>20</sub> arylalkylidene radical optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements, or a silylidene radical comprising up to 5 silicon atoms;
- R<sup>1</sup> is a C<sub>1</sub>-C<sub>40</sub> hydrocarbon group optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;
- R<sup>3</sup> is a C<sub>1</sub>-C<sub>40</sub> hydrocarbon group optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;
- R<sup>2</sup>, R<sup>4</sup> and R<sup>5</sup>, are the same or different from each other, and are hydrogen or C<sub>1</sub>-C<sub>40</sub> hydrocarbon groups optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements, with the proviso that at least one among R<sup>2</sup>, R<sup>4</sup> and R<sup>5</sup> is hydrogen;
- R<sup>6</sup> and R<sup>7</sup>, are the same or different from each other, and are hydrogen or C<sub>1</sub>-C<sub>40</sub> hydrocarbon groups optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;
- R<sup>8</sup>, are the same or different from each other, and are hydrogen or C<sub>1</sub>-C<sub>50</sub> hydrocarbon groups optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements, or two or more R<sup>8</sup> optionally can join

together to form at least one 3-7 membered ring, the 3-7 membered ring comprising at least one heteroatom belonging to groups 13-16 of the Periodic Table of Elements, and the 3-7 membered ring optionally can be substituted with at least one C<sub>1</sub>-C<sub>20</sub> hydrocarbon group optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements; and

- R<sup>3</sup> with R<sup>4</sup> and/or R<sup>4</sup> with R<sup>5</sup> can optionally join to form a aliphatic or aromatic 3-7 membered ring optionally comprising at least one heteroatom belonging to groups 13-16 of the Periodic Table of Elements, the aliphatic or aromatic 3-7 membered ring optionally can comprise one or more hydrocarbon substituents comprising from 1 to 20 carbon atoms.

32. (New) A ligand comprising formulas (IIa), (IIIa) and (IVa) and/or their double bonds isomers





wherein:

- L is a divalent bridging group selected from a C<sub>1</sub>-C<sub>20</sub> alkylidene radical, a C<sub>3</sub>-C<sub>20</sub> cycloalkylidene radical, a C<sub>6</sub>-C<sub>20</sub> arylidene radical, a C<sub>7</sub>-C<sub>20</sub> alkylarylidene radical, or a C<sub>7</sub>-C<sub>20</sub> arylalkylidene radical optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements, or a silylidene radical comprising up to 5 silicon atoms;
- R<sup>1</sup> is a C<sub>1</sub>-C<sub>40</sub> hydrocarbon group optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;
- R<sup>3</sup> is a C<sub>1</sub>-C<sub>40</sub> hydrocarbon group optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;
- R<sup>2</sup>, R<sup>4</sup> and R<sup>5</sup>, are the same or different from each other, and are hydrogen or C<sub>1</sub>-C<sub>40</sub> hydrocarbon groups optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements, with the proviso that at least one among R<sup>2</sup>, R<sup>4</sup> and R<sup>5</sup> is hydrogen;
- R<sup>6</sup>, are the same or different from each other, and are hydrogen or C<sub>1</sub>-C<sub>40</sub> hydrocarbon groups optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;
- R<sup>3</sup> with R<sup>4</sup> and/or R<sup>4</sup> with R<sup>5</sup> can optionally join to form a aliphatic or aromatic 3-7 membered ring optionally comprising at least one heteroatom belonging to groups 13-16 of the Periodic Table of Elements, the aliphatic or aromatic 3-7 membered ring

optionally can comprise one or more hydrocarbon substituents comprising from 1 to 20 carbon atoms;

- $R^{10}$  is hydrogen or a  $C_1$ - $C_{40}$  hydrocarbon group optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;

- $R^{11}$ ,  $R^{12}$ ,  $R^{13}$  and  $R^{14}$ , are the same or different from each other, and are hydrogen or  $C_1$ - $C_{40}$  hydrocarbon groups optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements, or two adjacent  $R^{11}$ ,  $R^{12}$ ,  $R^{13}$  and  $R^{14}$  can optionally join to form a 3-7 membered ring optionally comprising at least one heteroatom belonging to groups 13-16 of the Periodic Table of Elements, the 3-7 membered ring optionally can comprise one or more hydrocarbon substituents comprising from 1 to 20 carbon atoms; and

- $R^{15}$  and  $R^{16}$ , are the same or different from each other, and are hydrogen or  $C_1$ - $C_{40}$  hydrocarbon groups optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements.

33. (New) The ligand of claim 32, wherein:

- M is titanium, zirconium or hafnium;

- p is 2;

- R is a linear or branched, cyclic or acyclic  $C_1$ - $C_{40}$ -alkyl radical,  $C_2$ - $C_{40}$  alkenyl radical,  $C_2$ - $C_{40}$  alkynyl radical,  $C_6$ - $C_{40}$ -aryl radical,  $C_7$ - $C_{40}$ -alkylaryl radical or  $C_7$ - $C_{40}$ -arylalkyl radical, optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;

- X is hydrogen, a halogen, or R;

- L is  $Z(R'')_2$ , wherein Z is a carbon or a silicon atom, and  $R''$  is a linear or branched, cyclic or acyclic  $C_1$ - $C_{10}$ -alkyl radical,  $C_2$ - $C_{10}$  alkenyl radical,  $C_2$ - $C_{10}$  alkynyl radical,  $C_6$ - $C_{10}$ -aryl radical,  $C_7$ - $C_{10}$ -alkylaryl radical, or  $C_7$ - $C_{10}$ -arylalkyl radical optionally comprising at least one heteroatom belonging to groups 13-17 of the Periodic Table of Elements;

34. (New) The ligand of claim 32, wherein:

- $R^1$  is a linear or branched, saturated or unsaturated  $C_1$ - $C_{20}$ -alkyl radical;



- $R^3$  is a linear or branched, saturated or unsaturated  $C_1$ - $C_{20}$ -alkyl radical or a  $C_6$ - $C_{40}$ -aryl, radical;
- $R^2$ ,  $R^4$  and  $R^5$  are hydrogen; and
- $R^6$  and  $R^7$  are hydrogen or a linear or branched, saturated or unsaturated  $C_1$ - $C_{20}$ -alkyl radical.

35. (New) A catalyst system obtained by contacting:

- a) at least one metallocene compound of formula (I);
- b) at least one alumoxane, or a compound able to form an alkylmetallocene cation; and
- c) optionally an organo aluminium compound.

36. (New) A catalyst system obtained by contacting:

- a) at least one metallocene compound selected from formula (IIa), (IIIa), or (IVa);
- b) at least one alumoxane, or a compound able to form an alkylmetallocene cation; and
- c) optionally an organo aluminium compound.

37. (New) A process for (co)polymerizing olefins comprising from 2 to 20 carbon atoms comprising contacting one or more of the olefins under polymerization conditions in presence of the catalyst system of claim 35.

38. (New) A process for (co)polymerizing olefins comprising from 2 to 20 carbon atoms comprising contacting one or more of the olefins under polymerization conditions in presence of the catalyst system of claim 36.

39. (New) The process according to claim 37, wherein the olefins are alpha-olefins comprising from 2 to 20 carbon atoms.

40. (New) The process according to claim 38, wherein the olefins are alpha-olefins comprising from 2 to 20 carbon atoms.

41. (New) The process according to claim 37, wherein the olefins are selected from propylene, ethylene, 1-butene, and combinations thereof.

42. (New) The process according to claim 38, wherein the olefins are selected from propylene, ethylene, 1-butene, and combinations thereof.